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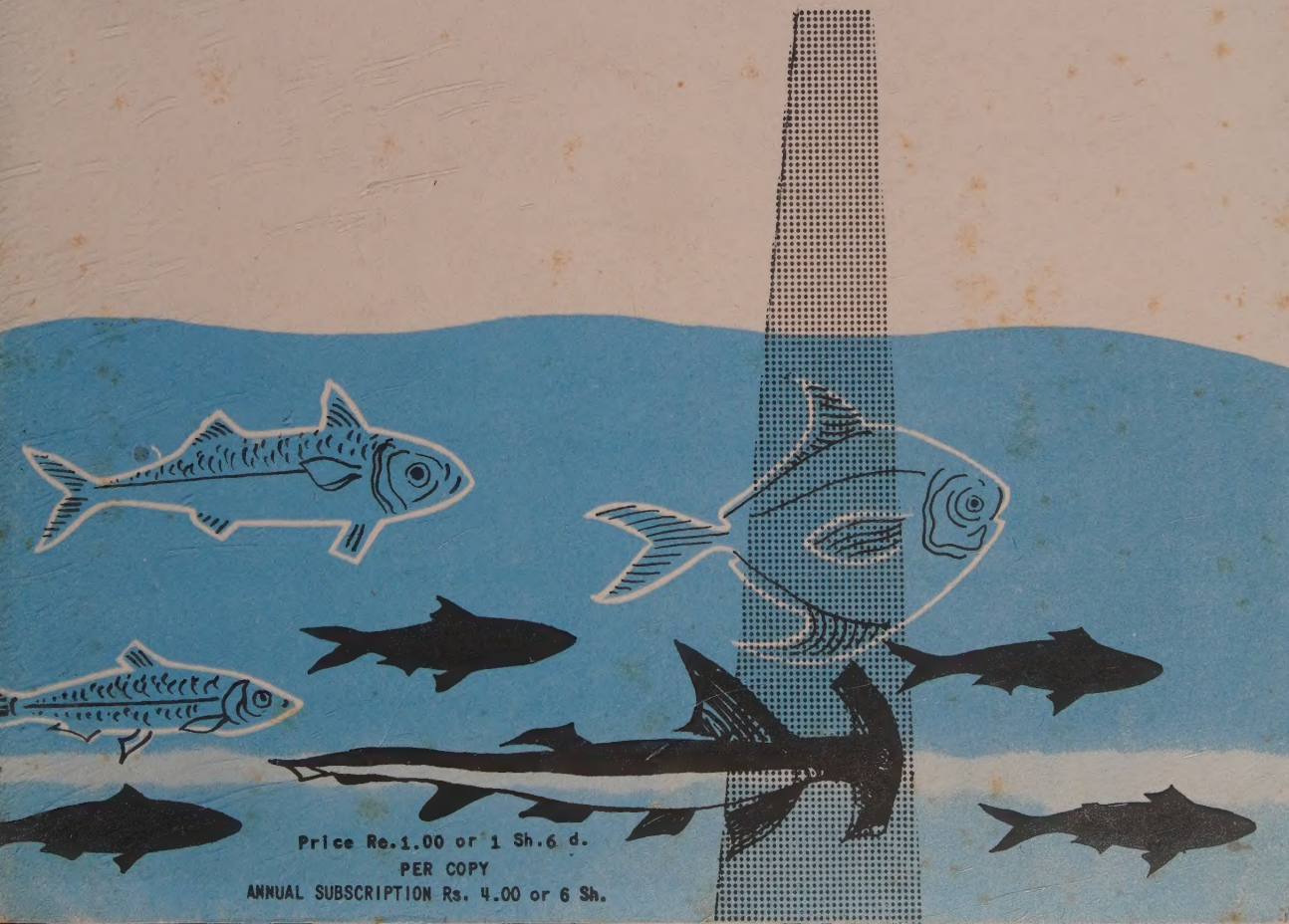
INDIAN FISHERIES BULLETIN



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INDIAN FISHERIES BULLETIN

Volume VIII, No. 3
July, 1961

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C—GENERAL FISHERY NEWS 38

produced and supplied to the Orissa Fisheries Department Investigations on the stocking ratio per acre of water to yield maximum production is being worked out.

The three species of Chinese Carps that are being grown in experimental ponds at Cuttack Sub-Station have shown indications of sexual maturity. It is hoped that during the next breeding season, it would be possible to breed two species, the Silver Carp and the Grass Carp by pituitary hormone treatment. If this proves to be successful it would have a far reaching beneficial effect on the culture fisheries development in India.

(Central Inland Fisheries Research Institute, Barrackpore).

Hilsa Fishery in Ganga River

Hilsa ilisha (Ham.) forms a fishery of commercial importance of the Ganga river system. Although Hilsa is available in the Ganga practically throughout the year, its seasons of abundance are post-monsoon, winter and early summer months with the heaviest catches in the months of October to December.

At Allahabad, Hilsa fishery of the Jumna river is considerably much more important than that of the Ganga river. The catches from about 50 mile stretch of the Jumna are assembled at Sadiapur landing centre while catches from about 36 mile stretch of the Ganga at Daragunj landing centre. The two assembly centres together handle over 80% of the total catches of the stretches mentioned above, the balance going directly to various fish godowns in the city.

Hilsa catches at Allahabad were maximum in 1956; landings in 1955 to 1957 were comparatively good, when Hilsa fishery constituted 36·70%, 59·4% and 40·2% respectively of the annual landings. The steep decline in Hilsa catches observed in 1958 is continued in the years 1959 and 1960.

The pattern of Hilsa fishery at Buxar situated about 220 miles east of Allahabad follows a similar trend as observed at Allahabad. While the maximum catches of Hilsa are recorded in the year 1957, it is seen that as at Allahabad the fishery was comparatively better in the years 1955 to 1957 and the steep decline in Hilsa fishery is also observed from 1958.

Both at Allahabad in U.P. and Buxar in Bihar, Hilsa fishery was extremely poor in the years 1958 to 1960. On the basis of data collected it is reasonable to conclude that Hilsa runs in the stretch of the Ganga in Bihar and U.P. were very low for the years 1958 to 1960.

(Central Inland Fisheries Research Sub-Station, Allahabad)

Detection of Hilsa Spawning ground

The eggs laravae and young fish survey conducted during the past one year has revealed that the spawning grounds of the important commercial species of fish, *Hilsa illisha,* are located in two general areas in the Hoogly estuarine System; one between Konnagar and Khusigoli on the Hooghly and the other in Rupnarain (near about Kolaghat). Probable spawning areas of other

important species have also been located. This finding is of considerable importance in formulating future programmes of work on the assessment of annual spawning of various species and prediction of abundance of year classes.

(Central Inland Fisheries Research Institute, Barrackpore).

Spawning of Hilsa

For the first time large scale spawning of *Hilsa* was observed in the Narbada river immediately below Gora. These observations are of significant importance in view of the construction of the proposed dam across Narbada river near Navagam in Broach district of Gujerat State about 2 miles up-stream of Gora. Further, this finding will also lead to detailed investigation on the recruitment and survival of young Hilsa population in the river. Investigations are being continued.

(Central Inland Fisheries Research Institute, Barrackpore).

Tagging Experiments

Extensive tagging of *Hilsa* was undertaken during January and February, 1961, in the Hoogly river near Barrackpore. The recoveries are being plotted to find out the trend of migration of *Hilsa* in this region. The results of extensive tagging experiments conducted in Chilka lake are being studied.

(Central Inland Fisheries Research Institute, Barrackpore).

Fish in Chilka Lake

The Union Government has approved a scheme for reclaiming the foreshore of the Chilka Lake for marine fish farming. In addition, a scheme for conservation of fisheries is being worked jointly by the Central and the State Fisheries Research workers at the Balugaon Research Station. Under the reclamation scheme, the wastelands in the foreshore of the Chilka Lake will be reclaimed to yield paddy lands and water areas for fish farming. Under the research scheme. Biologists will continue studies on the life history and bionomics of the important commercial fishes with a view to recommending conservation measures.

The following financial allotments have been made for these schemes for the year 1961-62.

	(Rs. in lakhs)
(a) Reclamation of foreshore of Chilka Lake	1·40
(b) Applied research on marine biology	0·31

Carp Seed Resources in the Narbada river in Gujarat State in 1960

Observations on the availability of seed of major carps at three Centres *viz.* Malsar, Poicha and Mangrol, during monsoon season of 1960 have shown that the seeds of Major Carps (*Catla Catla, Cirrihina mrigala* and *Labeo rohita*) are available in good percentage from 78·4% to 94·0% in the Carp seed collections in Narbada river draining Gujarat State. Of the three Centres Malsar has proved to be the most productive carp seed collection centre in this season, where the seed collection ground is the most ideal for simultaneous operation of over 100 nets under normal conditions during the major part of the season and over 20 nets during the highest floods in the river. About 1,30,50,000 carp fry were collected by operating 2 to 3 nets for 202 hours and the catch per net hour was estimated to be about 1,400. These observations have suggested the tremendous amount of carp seed that could be collected at this Centre by operating a good number of nets every day on continued basis throughout the season and this Centre alone can supply carp seed in good quantity to major portion of Gujarat State. At Malsar, about one furlong from seed collection ground in the vicinity of Malsar Railway Station, there are three to four uncared seasonal tanks which can be converted, with little expenditure, into several ideal nursery tanks for stocking carp seed.

Another Carp seed collection centre of comparatively lesser value has been established at Poicha in 1960 season. At this centre, about 8,00,000 Carp fry were collected by operating 2 to 3 nets for 227 hours. Due to unsuitability of the river bed during high floods, the carp seed can be collected in good abundance only on limited number of days. Under normal flood conditions in the river, 10 to 12 nets can be operated simultaneously at Poicha centre.

Mangrol Centre has been found to be unsuitable for the collection of carp seed on commerical basis. The observations at this centre showed that the carp seed is available in fair abundance, but due to unfavourable topography of the river bed and banks in the vicinity of Mangrol, very few nets could be operated regularly during very limited period.

(Central Inland Fisheries Research Institute, Barrackpore).

FISHERIES EXTENSION

Central Fisheries Extension Activities in 1960

Training:

During the year a total of 2,495 multiple-functionaries of C.D. and N.E.S. Blocks and 53 subject matter specialists were imparted training in inland fisheries work by the Central Fisheries Extension Units. Over 235 field personnel of State Fisheries Departments were given training in the use of improved methods of fish culture and inland fisheries management work, besides a large number of method demonstrations which were attended by State Fisheries officers. Over 284 farmers and village leaders were given special training in fish culture and 52 fishermen in fish seed collection.

Technical Assistance and Demonstrations.

Technical assistance was provided by the Units to State Fisheries Departments and C.D. and N.E.S. Blocks as well as private farmers in the application of the results of scientific researches carried out in our research institutes. The staff of the Fisheries Extension Units attended the meetings and seminars of Block Development Officers etc. in the State of Uttar Pradesh and Bihar to help them in formulating fisheries development programmes in the Block areas. Personal advice was given by the staff of the Units to a large number of State Fisheries Officers in meeting problems relating to field work in inland fisheries development.

Improved Fish Culture.

Assistance was given in the improvement of fish culture methods in 143 centres in various parts of the country. With a view to educating farmers and convincing them about the benefits of adopting scientific fish culture, a programme of demonstrating all stages of operations from the preparation of ponds to harvesting of crops in private fish farms has been initiated. During the year, work was started in 63 such centres. Private farmers or Panchayats, willing to undertake fish culture on modern lines under the guidance of the Units without demanding financial assistance have been selected for such result demonstrations. The extension staff have been associating themselves with all aspects of work in the selected farms and utilising the opportunity for conducting community talks, film shows, etc. This project has been started only in recent months and it will take a period of about a year more to actually show the farmers the increased yield obtained by following the improved methods. At the request of the State Fisheries Departments or the C.D. and N.E.S. Blocks, the Extension Units surveyed about 830 acres of pond area for the purpose of determining their suitability for fish culture and suggesting improvements to be effected for obtaining satisfactory yields.

Induced breeding.

The Extension Units carried out demonstrations of induced breeding in 22 centres in the States of U.P., Mysore, Bihar, Andhra Pradesh and Punjab and trained 170 persons in pituitary injection technique. During the demonstrations, 56,60,000 major carp seed and 25,000 Mirror carp seed were produced. It is hoped that during the ensuing season the State Fisheries Department will arrange for carrying out this work on a large scale in most of the States. The Extension Units are cooperating with the State Fisheries Departments in selecting centres for such work and arranging the necessary facilities for the rearing of seed produced.

Seed collection and distribution.

Technical assistance was given to a number of States in surveying selected stretches of rivers for the location of fish seed collection centres. About 873 miles of river were covered and 32 seed collection centres located in the States of U.P., Mysore, M.P., Andhra Pradesh, Punjab and Madras. Details of these centres with recommendations for exploiting them have been passed on to the respective State Fisheries Departments. During the surveys, about 18.1 lakhs of fish seed were collected and handed over to the State Fisheries Organisations. At the request of some of the State Governments, the Fisheries Extension Unit,

(c) *Central Fisheries Technological Research Station, Ernakulam/Cochin.*

Investigations on the spoilage of prawns, chemical and bacteriological studies on marine prawns and fish curing and preservation studies have been intensified in the Processing Wing. At Bombay, a fish-meal plant secured under T.C.M. aid is being installed.

Design studies on fishing vessels required for the Government of India fleet were undertaken at the Craft and Gear Wing. An Engine Section has been set up recently. Investigations on gear material, gear design and fishing methods have been intensified. More centres have been covered under the survey of the indigenous fishing gear undertaken by the Station.

Deep Sea Fishing Station, Bombay

This station continued exploratory fishing operations mainly with trawl gear. One of the vessels of the Station "Jheenga" has been drafted for pilot commercial fishing. Important features during the year were the use of hemp twine for fabrication of trawls, introduction of 45 ft. Russian trawl, the catches of which averaged nearly 1500 Kgram per hour and the use of thermocole for the insulation of the fish holds. The off-shore stations at Cochin, Tuticorin, and Visakhapatnam continued their activities satisfactorily. Preliminary work for the organisation of off-shore fishing work at Veraval, Mangalore and at Paradwip during the Third Five Year Plan has been taken on hand.

The Ice and Cold Storage Plant attached to the Deep Sea Fishing Station Bombay, recorded good progress. The plant produced 2104 tons of ice, and provided storage space for 1183 tons of fresh fish in addition to freezing about 130 tons of quality fish.

Fisheries Extension Units

With the establishment of an additional unit at Raipur in Madhya Pradesh, there are at present 10 Fisheries Extension Units functioning in various States. The programmes of these Units have been reorientated laying greater emphasis on the training of village level workers and field staff of the State Fisheries Departments. Technical assistance was given to a number of States in conducting induced breeding of Major Carps. Demonstration and advice in the application of new and improved fish culture techniques were arranged at a number of Centres. Two regional refresher courses were organised at Barrackpore and Mysore for fishery officers working in C.D. and N.E.S. Blocks. The Fisheries Extension Units at Calcutta organised the supply of 2,16,87,184 carp fry to deficit States.

Record Fish Production in 1960

Fish production in India during 1960 has been the highest ever recorded Sea fish landings were about 8.8 lakh metric tons. Marketable surplus of inland catches, including estuaries was over 2:8 lakh tons. These together with subsistence fishing in inland waters and small ponds have placed the total fish yield in India well over 14 lakh tons, which was the target for the final year of the Second Plan period.

The highlights of the 1960 fishery were the excellent yields of sardine and mackerel. Mechanisation of fishing craft and introduction of synthetic fishing twine contributed to increased fish production. Inland fisheries have received

impetus by induced breeding of carps and the introduction of a new variety of quick-growing fish called the "Common Carp" from the Far East.

Fish Catch & Landings by Groups of Species in India—(In 000 Metric tons)

Year	Fresh water fishes	Flounders, Halibuts soles etc	Herring, Sardines, Anchovices etc.	Tunas, Bonitos, Mackerel, etc.	Misc. Marine teleosteans.	Sharks Rays, Skates etc.	Crustaceans	Total Catch and landings.
1	2	3	4	5	6	7	8	9
1950	236·8	32·4	165·4	118·9	171·1	17·4	74·9	816·9
1951	217·8	6·8	143·6	129·6	147·1	29·5	76·6	751·0
1952	215·7	9·6	126·2	120·7	156·8	38·1	77·0	744·1
1953	237·5	19·3	123·1	132·5	199·9	15·9	90·7	818·9
1954	240·3	11·4	118·9	66·3	221·3	16·1	154·2	828·5
1955	243·3	8·8	124·0	64·9	271·0	20·4	106·6	839·0
1956	293·5	10·5	114·0	56·8	356·1	21·9	159·5	1,012·2
1957	357·5	8·7	293·0	139·4	279·5	23·1	136·8	1,233·0
1958	308·7	12·9	221·6	176·3	233·9	24·3	86·7	1,064·4
1959	238·6	10·4	173·5	103·5	205·8	23·5	67·5	822·8
1960	281·7*	14·1	301·8	165·4	290·7	35·6	70·6	1,159·9

*The figures for inland fish production which used to be calculated formerly as a percentage of marine production has been changed from this year onwards to actual figures of production supplied by the States. These figures are, however, incomplete and does not take into account subsistence fishing which is quite considerable in inland areas.

Disposition of Fish Catch in India

(In 000 Metric tons)

Year	Marketing fresh	Cured		Reduction	Total
		Sundried	Salted		
1951	320·6	194·6	186·2	49·6	751·0
1952	317·9	192·7	184·0	49·5	744·1
1953	349·7	212·1	203·1	54·0	818·9
1954	353·8	214·6	205·4	54·7	828·5
1955	358·4	217·3	208·1	55·3	839·1
1956	432·3	262·2	251·0	66·8	1,012·3
1957	526·5	319·4	305·8	81·3	1,233·0
1958	454·5	275·6	264·0	70·3	1,064·4
1959	351·3	213·1	204·1	54·3	822·8
1960	555·6	269·1	237·8	97·4	1,159·9

Fishing operations report for the quarter ending March, 1961 of the vessels of Government of India, Deep Sea Fishing Station, Bombay, Veraval and Offshore Fishing Stations, Tuticorin, Cochin and Visakhapatnam

Name of the Vessel	No. of days absent from the port.	Quantity of Fish caught (kgms.)	Catch/ day's absence (kgms)	Value realised Rs. nP.
Bombay				
1. M. F. V. Jheenga	51	67181	1315	25287·84
2. M. F. V. Bumili	46	29132	633	7368·81
3. M. L. Sagar Pravasi 4. M. F. V. Champa 5. M.F.V. Sagarvihari	No Fishing due to repairs.			
Cochin				
6. M. T. Pratap	46	112291	2441	13651·89
7. M. L. Durga	46	31207	671	10694·46
8. M. V. Tarpon	51	42272	829	9403·50
9. M. V. Samudra	61	254087	4165	15797·92
10. M. F. V. Bangada	Trial operation but no fishing.			
Visakhapatnam				
11. M. T. Ashok	8	3056	383	994·01
12. M. V. Gudjon	38	10120	263	2652·14
13. M. V. Seahorse	53	8878	168	236 50
14. M. V. Sagarkumari	17	3355	197	327·00*
15. Dan Boat No. II	59	3322	56	1421·50
Tuticorin				
16. M. V. Meenakshi	37	2714	73	590·00
17. M. V. Sardinella	60	4484	75	1158·50
18. M. V. Sagarsundri.	52	4265	82	733·43
19. M. V. Meenalochani	30	2707	90	440·83
Veraval				
20. M. L. Meera	38	5027	132	1448·30
21. M. L. Sagarkanti	43	7190	167	3726·59

*Sale proceeds for January, 1961 is not included.

The Landings of Four Bull Trawlers of New India Fisheries Ltd., Bombay for the Quarter Ending March, 1961

Name of the Vessel.	Period of voyage	No. of days absent from the port.	Quantity caught (Tons.)	Catch/ day's absence Tons	Depth fished (Meters)
Satpati' & 'Pilotan'.	7-1-61 to 16-1-61	10	70	7·0	34—41
	17-1-61 to 27-1-61	11	75	6·8	28—40
	28-1-61 to 6-2-61	10	82	8·2	27—41
	7-2-61 to 16-2-61	10	79	7·9	26—38
	17-2-61 to 26-2-61	10	80	8·0	27—38
	27-2-61 to 9-3-61	11	78	7·1	28—40
	10-3-61 to 21-3-61	12	78	6·5	26—44
	23-3-61 to 31-3-61	10	66	6·6	31—44
Arnala' & 'Paj'.	28-12-60 to 6-1-61	10	61	6·1	27—41
	9-1-61 to 20-1-61	13	74	5·7	22—34
	21-1-61 to 1-2-61	12	75	6·2	21—40
	2-2-61 to 12-2-61	11	73	6·6	27—36
	13-2-61 to 21-2-61	9	77	8·5	26—35
	22-2-61 to 5-3-61	12	73	6·1	22—42
	6-3-61 to 16-3-61	11	81	7·3	31—40
	17-3-61 to 24-3-61	8	38	4·6	34—45
	25-3-61 to 4-4-61	11	70	6·4	24—45

New India Fisheries Ltd. are extending their activities to Cochin. Fishery survey off Mysore Coast was conducted by a vessel of Aichi Prefectural Government under the auspices of the State Government with a view to organise a fishing company as a joint venture.

The Government of India Quick Freezing and Cold Storage Plant at Bombay

The income realised from different activities during the period January 1961 to March 1961 are as follows:—

Activity	Value realised Rs. nP.
1. Sale of ice (494 M. Tons 780 Kgs.)	13,799·59
2. Basket storage of fresh fish	8,755·64
3. Freezing Charges of fresh fish	4,138·50
4. Frozen fish storage rental	13,516·33
TOTAL	40,210·06

Ice Factories in Delhi and their installed Capacities

S. No.	Name of factory	Capacity (tons.)
1.	Prag D.W. Ice Factory & Cold Storage	178
2.	Rajendra Ice & Cold storage	61
3.	Mahabir Ice Mills (P) Ltd.	60
4.	Imperial Ice Factory	57
5.	Crystal Ice Factory (P) Ltd.	50
6.	Nav Bharat C. S. & Ice Mills Ltd.	44
7.	Narbada C. S. & Ice Factory	30
8.	Friends Ice (P) Ltd.	30
9.	Kumar Ice Factory (P) Ltd.	30
10.	Jai Hind Ice Factory	25
11.	Jagatjit Distilling & A. I. Ltd.	23
12.	Ramchand Luchmandas Ice Factory	22
13.	Jwala Ice Factory	20
14.	Lakshmi Ice Factory	19
15.	Narula Ice Factory	18
16.	Jamna Ice Factory	18
17.	Rama Ice Factory	15
18.	Partap Ice Factory	14
19.	Raisina C. S. & Ice Co. Ltd.	13
20.	National C. S. & Refg. Ltd.	10
21.	Vijai Ice Factory	5
22.	Jeewan Industries & Cold Storages	25
23.	Luxmi Ice Factory	30
24.	Ganesh Ice Factory	35
25.	Vermani Ice & Cold Storage	22
26.	Rama Ice Factory	30
27.	Khanna Ice Factory	12
28.	Prem Ice Factory	35
	TOTAL	931

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Month-wise ex-factory rates of Ice

Month	Average approximate sale of all factories per day (in tons)	Average selling rate of ice ex-factory	
		per 100 lb.	per metric ton.
		Rs.	Rs.
April	400	1/8	30/
May	550	2/8	50/
June	600	3/0 to 3/8	60/ to 70/-
July	400	1/12	35/
August	350	1/12	35/
September	350	/12/	15/
October	250	/12/	15/
November	150	/10/	12/8
December	100	/10/	12/8
January	75	/10/	12/8
February	75	/10/	12/8
March	150	/10/	12/8

Review of the Progress of Work of the Indo-Norwegian Project during 1960-61.

The fisheries activities in the Indo-Norwegian Fishing Community Development Project directed mainly towards accelerating the programmes of mechanised fishing by the introduction of improved types of fishing boats, experimental fishing and training recorded, considerable progress during 1960-61.

Fisheries Section.

Experimental trawling, purse-seining, drift net, trolling and hand line fishing, Pair—trawling etc. were conducted by Medium boats, 'M-1' to 'M-6', M/V 'Ashtamudi', M/V "Flying Fish", 25 ft. boats, I.N.P. boats, 'Ovald' boats and R/V 'Kalava', which operated from four centres of Quilon, Cochin, Tellicherry and Beypore. Experimental trawling indicated the abundance of prawns from 8 to 12 fathoms line South-West of Cochin and west of Tellicherry in 5-7 fathoms in a length of 8 n. miles. Trawling off Needakara with 25 ft. boats and I.N.P. boats and troll-line experiments by 'Ovald' boats gave promising results.

The operations by the Project vessels brought in a total landings of 712,035 Kos of fish realising Rs. 213,159 compared to 558,029 Kos and Rs. 172,522 in 1959-60; the total landings in 1960-61 showed 28% higher returns, primarily due to an increase in the fishing efforts. The Project vessels operated for 1388 boat days during 1960-61 against 997 in 1959-60. The annual landings by the 22 ft., 23½ft., and 25 ft., boats issued to the fishermen of the Project area showed that as compared to 1959-60, the total landings by the 22 ft. mechanised boats recorded 86% better returns in 1960-61. The increase in the total landings is directly due to the quantum of fishing efforts [illegible]d by a higher average yield. The average annual returns from the 2[illegible] boats were 9,460 Kos. of fish for Rs. 3,170.44—and those from 25 ft. boats were 13,256 kos. for Rs. 4,988·36.

In the I.N.P. Boat Yard and workshop, twelve 25 ft. I.N.P. boats and five 23½ ft. Ovald type boats were completed while 5 I.N.P. boats and 3 ovald boats were under various stages of construction against a target of 17 I.N.P. boats and 8 ovald boats for the year. A 92 ft. steel Research Vessel is under construction in Norway. Besides, several repair, maintenance and manufacturing works connected with Projects fishing vessels, insulated vans, beach landing experiments, Refrigeration Plant, Health Centre etc. repair work of boats issued to fishermen have been undertaken. The overhauling, repairs and replacement of parts of electronic and electrical equipment of I.N.P. boats and vessels were carried out. At the I.N.P. Sea House, Cochin and I.N.P. Training Centre, Neendakara, fabrication of new fish trawls, net making, repairs of various fishing gear etc. were carried out.

Refrigeration Plant.

15,64,850 kgs. of ice was produced and 15,49,375 kgs of ice was issued. A total quantity of 179,60 kgs of prawns and 2,35,248 kgs. of fish were received at the cold storage plant while the total quantity of fresh prawns and fish handled at the plant during 1959-60 was 69,604 kgs. 17,321 kgs of fresh fish was processed in the deep freeze and 9,051 kgs. of frozen fish was issued for sale.

Marketing Experiments.

During the year, the main programme of the Marketing Section was to effect change in the disposal of the fish landings at Cochin. A new route Cochin-Valparai was planned and the exploration of the Quilon-Shencottah route and the local sale both at Quilon and Cochin were intensified. Due to the increase in capacity of private freezing plants in and around Cochin, the demand for prawns has been steadily going up at good prices. In order to supply fish during off-season and to find out the reaction of consumers in the different markets with regard to frozen fish, about 10 tons of fish have been frozen. Marketing in the High Ranges has been advantageous economically. During the year, 708,873 kgs. of fish and prawns were sold realising Rs. 213,713. The remarkable improvement in the sale proceeds of the fish is the direct result of the departmental marketing in contrast to marketing through contract basis in 1959.

Fishermen Training Centre.

The 10th batch of 23 trainees started a two months course in January, 1961. In addition to training in the handling, repairs and maintenance of mechanised boats, fishery biology, socio-economics, fish handling, marketing and navigational rules, experimental fishing with small boats were integrated with the training programme.

Marine Research.

Research operations were continued by R/V 'Kalava' throughout the year in close cooperation with Central Marine Fisheries Research Institute.

Life Saving Unit.

Project boats conducted search and gave aid to missing mechanised boats and indigenous canoes in distress on several occasions. M/V "Ashtamudi" was fitted with special equipment for the purpose.

Health Section.

Work in the Preventive and Curative Clinics and the Maternity ward continued satisfactorily throughout the year. The maternity ward has been fully occupied by patients throughout the year. In the Preventive Clinic the number of visits has continued to increase. The Curative Clinic has had an average of more than 250 patients per day. The tuberculosis control programme has continued with examinations once a week and treatment twice. The response on treatment seems to be extremely good in the tropic conditions but the infection rate is still high. There has been no severe epidemic in the project area during the year. Family planning programme has continued satisfactorily.

The water supply scheme is progressing. The purification plant and the pump station at Sasthamcottah were completed and approximately 75% of the pipes were laid. The supply of safe water still remains a problem. Many of the wells have been inspected and the defective have been cleaned and chlorinated. 188 private latrines have been constructed and a number of old ones

made serviceable. A survey has shown that more than 50% of the constructed latrines are in regular use.

Social work in connection with instruction in hygiene, sanitation, family planning, cultural activities and classes for illiterate fishermen in the project area have been continued.

Construction Work.

The appointment of a Planning and Construction Committee was approved by the Standing Committee. The foundation stone for the I.N.P. Fishery Station at Ernakulam was laid by Mr. Kristian Gleditsch, Chairman of the Board of Directors of the Norwegian India Foundation on 3rd December, 1960. The construction of a reclamation wall, compound wall and several store buildings are in progress. The plans for the slip-way, workshop and other buildings at Ernakulam are nearing completion.

At the I.N.P. Refrigeration Plant at Neendakara, the construction of the automobile repair section, tiffin shed and garage were completed while that of fish box shed, welfare building etc. was started. The installation of a tunnel freezer is expected to be finished shortly. The construction of the store and welfare building at the Boat Yard and Workshop has proceeded.

In the Health Section, the quarters for the Assistant Surgeon and the laundry building at Victoria Hospital have been completed and staff quarters is nearing completion. Steps have been taken for the construction of curative clinics, children's ward and the tuberculosis clinic. All equipment received from Norway for the Public Health Laboratory have been installed.

Administration.

During the year 1960-61, Norwegian expenditure in Norway and in India was Rs. 21,55,000 and Rs. 11,74,793 respectively bringing the total expenditure since its inception to Rs. 2,52,58,993. The Indian expenditure during the year was Rs. 6,59,092, which brought the progressive total to Rs. 30,92,297. Revenue realised during the year was Rs. 2,89,697.

The Standing Committee of the Indo-Norwegian Project held three meetings during the year under review at Oslo, Bombay and Neendakara.

Inland.

Fish Breeding Experiments.

Experiments on breeding of the Bangkok strain of Common Carp, *Cyprinus carpio*, and the Mirror carp were undertaken extensively. Further improvements were effected in breeding techniques of both these species of fishes. It has now been possible to breed the Mirror carp, which has hitherto been known to breed only at higher elevations, even at low elevations as at Cuttack in Orissa. A detailed pamphlet on the breeding of *Cyprinus carpio* for the use of fishery workers in other parts of India is under preparation. During the first quarter of 1961, 33,800 fry of *Cyprinus carpio of* 1"—2½" size were supplied to the West Bengal Fisheries Department. Smaller consignments of this fish were also given to the Pondicherry Fisheries Department and some private parties. 18,50,000 spawn of the same fish was

produced and supplied to the Orissa Fisheries Department Investigations on the stocking ratio per acre of water to yield maximum production is being worked out.

The three species of Chinese Carps that are being grown in experimental ponds at Cuttack Sub-Station have shown indications of sexual maturity. It is hoped that during the next breeding season, it would be possible to breed two species, the Silver Carp and the Grass Carp by pituitary hormone treatment. If this proves to be successful it would have a far reaching beneficial effect on the culture fisheries development in India.

(Central Inland Fisheries Research Institute, Barrackpore).

Hilsa Fishery in Ganga River

Hilsa ilisha (Ham.) forms a fishery of commercial importance of the Ganga river system. Although Hilsa is available in the Ganga practically throughout the year, its seasons of abundance are post-monsoon, winter and early summer months with the heaviest catches in the months of October to December.

At Allahabad, Hilsa fishery of the Jumna river is considerably much more important than that of the Ganga river. The catches from about 50 mile stretch of the Jumna are assembled at Sadiapur landing centre while catches from about 36 mile stretch of the Ganga at Daragunj landing centre. The two assembly centres together handle over 80% of the total catches of the stretches mentioned above, the balance going directly to various fish godowns in the city.

Hilsa catches at Allahabad were maximum in 1956; landings in 1955 to 1957 were comparatively good, when Hilsa fishery constituted 36·70%, 59·4% and 40·2% respectively of the annual landings. The steep decline in Hilsa catches observed in 1958 is continued in the years 1959 and 1960.

The pattern of Hilsa fishery at Buxar situated about 220 miles east of Allahabad follows a similar trend as observed at Allahabad. While the maximum catches of Hilsa are recorded in the year 1957, it is seen that as at Allahabad the fishery was comparatively better in the years 1955 to 1957 and the steep decline in Hilsa fishery is also observed from 1958.

Both at Allahabad in U.P. and Buxar in Bihar, Hilsa fishery was extremely poor in the years 1958 to 1960. On the basis of data collected it is reasonable to conclude that Hilsa runs in the stretch of the Ganga in Bihar and U.P. were very low for the years 1958 to 1960.

(Central Inland Fisheries Research Sub-Station, Allahabad)

Detection of Hilsa Spawning ground

The eggs laravae and young fish survey conducted during the past one year has revealed that the spawning grounds of the important commercial species of fish, *Hilsa illisha*, are located in two general areas in the Hoogly estuarine System; one between Konnagar and Khusigoli on the Hooghly and the other in Rupnarain (near about Kolaghat). Probable spawning areas of other

important species have also been located. This finding is of considerable importance in formulating future programmes of work on the assessment of annual spawning of various species and prediction of abundance of year classes.

(Central Inland Fisheries Research Institute, Barrackpore).

Spawning of Hilsa

For the first time large scale spawning of *Hilsa* was observed in the Narbada river immediately below Gora. These observations are of significant importance in view of the construction of the proposed dam across Narbada river near Navagam in Broach district of Gujerat State about 2 miles up-stream of Gora. Further, this finding will also lead to detailed investigation on the recruitment and survival of young Hilsa population in the river. Investigations are being continued.

(Central Inland Fisheries Research Institute, Barrackpore).

Tagging Experiments

Extensive tagging of *Hilsa* was undertaken during January and February, 1961, in the Hoogly river near Barrackpore. The recoveries are being plotted to find out the trend of migration of *Hilsa* in this region. The results of extensive tagging experiments conducted in Chilka lake are being studied.

(Central Inland Fisheries Research Institute, Barrackpore).

Fish in Chilka Lake

The Union Government has approved a scheme for reclaiming the foreshore of the Chilka Lake for marine fish farming. In addition, a scheme for conservation of fisheries is being worked jointly by the Central and the State Fisheries Research workers at the Balugaon Research Station. Under the reclamation scheme, the wastelands in the foreshore of the Chilka Lake will be reclaimed to yield paddy lands and water areas for fish farming. Under the research scheme. Biologists will continue studies on the life history and bionomics of the important commercial fishes with a view to recommending conservation measures.

The following financial allotments have been made for these schemes for the year 1961-62.

	(Rs. in lakhs)
(a) Reclamation of foreshore of Chilka Lake	1·40
(b) Applied research on marine biology	0·31

Carp Seed Resources in the Narbada river in Gujarat State in 1960

Observations on the availability of seed of major carps at three Centres *viz.* Malsar, Poicha and Mangrol, during monsoon season of 1960 have shown that the seeds of Major Carps (*Catla Catla, Cirrihina mrigala* and *Labeo rohita*) are available in good percentage from 78·4% to 94·0% in the Carp seed collections in Narbada river draining Gujarat State. Of the three Centres Malsar has proved to be the most productive carp seed collection centre in this season, where the seed collection ground is the most ideal for simultaneous operation of over 100 nets under normal conditions during the major part of the season and over 20 nets during the highest floods in the river. About 1,30,50,000 carp fry were collected by operating 2 to 3 nets for 202 hours and the catch per net hour was estimated to be about 1,400. These observations have suggested the tremendous amount of carp seed that could be collected at this Centre by operating a good number of nets every day on continued basis throughout the season and this Centre alone can supply carp seed in good quantity to major portion of Gujarat State. At Malsar, about one furlong from seed collection ground in the vicinity of Malsar Railway Station, there are three to four uncared seasonal tanks which can be converted, with little expenditure, into several ideal nursery tanks for stocking carp seed.

Another Carp seed collection centre of comparatively lesser value has been established at Poicha in 1960 season. At this centre, about 8,00,000 Carp fry were collected by operating 2 to 3 nets for 227 hours. Due to unsuitability of the river bed during high floods, the carp seed can be collected in good abundance only on limited number of days. Under normal flood conditions in the river, 10 to 12 nets can be operated simultaneously at Poicha centre.

Mangrol Centre has been found to be unsuitable for the collection of carp seed on commerical basis. The observations at this centre showed that the carp seed is available in fair abundance, but due to unfavourable topography of the river bed and banks in the vicinity of Mangrol, very few nets could be operated regularly during very limited period.

(Central Inland Fisheries Research Institute, Barrackpore).

FISHERIES EXTENSION

Central Fisheries Extension Activities in 1960

Training:

During the year a total of 2,495 multiple-functionaries of C.D. and N.E.S. Blocks and 53 subject matter specialists were imparted training in inland fisheries work by the Central Fisheries Extension Units. Over 235 field personnel of State Fisheries Departments were given training in the use of improved methods of fish culture and inland fisheries management work, besides a large number of method demonstrations which were attended by State Fisheries officers. Over 284 farmers and village leaders were given special training in fish culture and 52 fishermen in fish seed collection.

Technical Assistance and Demonstrations.

Technical assistance was provided by the Units to State Fisheries Departments and C.D. and N.E.S. Blocks as well as private farmers in the application of the results of scientific researches carried out in our research institutes. The staff of the Fisheries Extension Units attended the meetings and seminars of Block Development Officers etc. in the State of Uttar Pradesh and Bihar to help them in formulating fisheries development programmes in the Block areas. Personal advice was given by the staff of the Units to a large number of State Fisheries Officers in meeting problems relating to field work in inland fisheries development.

Improved Fish Culture.

Assistance was given in the improvement of fish culture methods in 143 centres in various parts of the country. With a view to educating farmers and convincing them about the benefits of adopting scientific fish culture, a programme of demonstrating all stages of operations from the preparation of ponds to harvesting of crops in private fish farms has been initiated. During the year, work was started in 63 such centres. Private farmers or Panchayats, willing to undertake fish culture on modern lines under the guidance of the Units without demanding financial assistance have been selected for such result demonstrations. The extension staff have been associating themselves with all aspects of work in the selected farms and utilising the opportunity for conducting community talks, film shows, etc. This project has been started only in recent months and it will take a period of about a year more to actually show the farmers the increased yield obtained by following the improved methods. At the request of the State Fisheries Departments or the C.D. and N.E.S. Blocks, the Extension Units surveyed about 830 acres of pond area for the purpose of determining their suitability for fish culture and suggesting improvements to be effected for obtaining satisfactory yields.

Induced breeding.

The Extension Units carried out demonstrations of induced breeding in 22 centres in the States of U.P., Mysore, Bihar, Andhra Pradesh and Punjab and trained 170 persons in pituitary injection technique. During the demonstrations, 56,60,000 major carp seed and 25,000 Mirror carp seed were produced. It is hoped that during the ensuing season the State Fisheries Department will arrange for carrying out this work on a large scale in most of the States. The Extension Units are cooperating with the State Fisheries Departments in selecting centres for such work and arranging the necessary facilities for the rearing of seed produced.

Seed collection and distribution.

Technical assistance was given to a number of States in surveying selected stretches of rivers for the location of fish seed collection centres. About 873 miles of river were covered and 32 seed collection centres located in the States of U.P., Mysore, M.P., Andhra Pradesh, Punjab and Madras. Details of these centres with recommendations for exploiting them have been passed on to the respective State Fisheries Departments. During the surveys, about 18.1 lakhs of fish seed were collected and handed over to the State Fisheries Organisations. At the request of some of the State Governments, the Fisheries Extension Unit,

Calcutta, resumed the organisation and supervision of fish seed transport to deficit States late in the season. About 2,16,87,200 carp fry were supplied to different states by the adoption of improved methods of packing fish seed in oxygen-filled plastic bags; the mortality of fry during transport was brought down to a very negligible percentage. In two centres in Bihar and Madras, demonstrations and special training were conducted in modern methods of fish seed transport. As a result of field trials conducted at the Mandapam Unit, methods of reducing the mortality of Chanos seed during transport have been devised. Nursery practices have been introduced in certain areas in West Bengal and Andhra Pradesh, where such practices never existed before.

Breeding of Common carp.

The technique of common carp breeding which has been successfully tried at the Central Inland Fisheries Research Institute was demonstrated in Andhra Pradesh and West Bengal. The Units are now making necessary arrange- to build up stocks of common carp fry to help the States in overcoming the fish seed shortage.

Fish curing and sea weed utilisation.

The Mandapam Unit demonstrated improved methods of fish curing in 14 centres along the Madras coast and trained fishermen in better methods of handling and storage of cured fish products. Six Demonstrations were conducted on the utilisation of sea weeds for preparation of jellies, manure, etc. Some parties have now evinced interest in starting small scale sea weed industry.

Other demonstrations.

The Calcutta Unit gave assistance in the control of epidemics of fish mortality in extensive areas of sewage-fed fisheries in the neighbourhood of Calcutta. This helped in saving large quantities of fish from being lost on account of parasitic infection and physico-chemical changes. The use of Gammaxene for the control of fish lice and other external parasites was demonstrated in two centres in West Bengal.

Demonstrations of chemical and mechanical means of weed control in fish ponds were carried out at 17 centres in the States of West Bengal, Andhra Pradesh, Bihar, Punjab, U.P., and Madhya Pradesh. The Allahabad Unit has devised some inexpensive mechanical de-weeders for the control of submerged weeds in fish ponds and demonstrated their use to the State fisheries personnel as well as gramsevaks of C.D. and N.E.S. Blocks. The Extension Units in Madhya Pradesh, Mysore, Andhra Pradesh, Punjab and West Bengal conducted demonstrations of improved methods of fishing in 35 centres.

Information.

Only six of the Units have at present equipment for audio-visual demonstrations. These units organised 307 film shows relating to new methods of fishing, fish culture, fish processing, etc. About 2·5 lakhs of farmers and fishermen have witnessed these shows. Some of the Units have now prepared series of lantern slides and film strips for use in connection with their educational and informational programme. Thirteen pamphlets and handouts on fishery matters, besides a number of posters, charts, models, etc. have been

prepared. The Bhopal Unit has prepared three short information films and also arranged for the supply of fisheries education and publicity material required by the C.D. and N.E.S. Blocks in the State. The Fisheries Extension Units participated in a total of 63 exhibitions and melas attended predominantly by farmers and fishermen. Besides two radio-talks, 230 community talks on fishery subjects were given by the staff of the Extension Units in different parts of the country.

(Fisheries Extension Newsletter, Vol. II, No. 1, March, 1961, New Delhi.)

Fisheries in Community Development Blocks

To give an impetus to the fisheries programme in C.D. Block areas, it has been decided that in blocks along the coast or areas where fisheries are a predominant occupation, an Extension Officer for Fisheries may be appointed in addition to the Extension Officer for Animal Husbandry. Provision for fisheries in the Schematic budget is now made along with agriculture and animal husbandry under the head "Agriculture and Land Improvement". To remove the conflicting jurisdiction of fishery rights in tanks and ponds, the panchayats are being entrusted with rights for fisheries in small tanks and ponds.

(Agricultural situation in India, Vol. XV, No. 9, December, 1960)

Trade

EXPORT—1960

Articles and Countries to which exported	*Quantity* (K. grams)	*Value* (Rs.)
031 Fish fresh or simply preserved		
031·01 Fish fresh chilled or frozen		
Fresh fish live or dead others		
U. K.	102	1,244
Germany W.	512	3,059
Singapore	36,503	58,432
Malaya	461	1,000
Japan	1,000	5,248
Kenya	154	1,598
U.S.A.	4,322	17,234
Bahrein Is.	1,270	3,431
Kuwait	2,591	5,870
Saudi Arab	254	870
Nepal	..	4
	47,168	97,990

Articles and Countries to which exported	*Quantity (K. grams)*	*Value (Rs.)*
Bangdas wet salted		
Kuwait	2,560	2,338
Ceylon	207,024	1,43,786
	2,09,584	1,46,124
Soormai wet salted		
Ceylon	1,64,972	1,66,218
	1,64,972	1,66,218
Other fish wet salted.		
Ceylon	52,412	41,664
Kuwait	1,229	2,360
U.S.A.	6,440	30,089
	60,081	74,113
TOTAL 031·01	3,81,805	4,84,445
031·02 Fish salted dried or smoked but not further prepared.		
Bomlas dry unsalted		
U. K.	7,378	43,964
Ceylon	11,59,471	24,63,423
Singapore	20,784	42,037
Burma	61,133	1,10,638
Rhodesia S.	1,020	2,903
Mauritius	1,17,620	2,07,754
Kuwait	152	290
Zanzibar	254	200
Kenya	406	909
Tanganyika	457	764
Australia	762	1,255
	13,70,555	28,77,387
Fish dried unsalted		
Other sorts—		
Kuwait	1,270	4,000
Ceylon	15,91,450	36,75,701
Singapore	19,252	25,279
Malaya	5,309	25,832
U. K.	831	3,979
Saudi Arab	51	78
Fiji Is.	152	305
	16,18,497	37,35,174
Fish dried salted		
Ceylon	71,95,162	1,39,61,304
Tanganyika	51	45
Bel. Congo	..	62
Fiji Is.	203	475
	71,95,416	1,39,61,886

Articles and Countries to which exported	*Quantity* (*K. grams*)	*Value* (*Rs.*)
Shark Fin. Fishmaws.		
Similar Fish Parts.		
U. K.	85,141	8,90,343
Singapore	1,64,558	8,64,117
Malaya	2,636	13,140
Hongkong	28,643	2,79,127
	2,80,978	20,46,727
Others sorts		
Ceylon	13,252	18,013
Singapore	3,015	4,158
U.S.A.	1,176	4,856
	17,443	27,027
TOTAL 031·02	1,04,82,889	2,26,48,201
031·03 Crustacea and Molluscs fresh frozen salted dried or simply cooked.		
Crustacea Excl. Prawn		
Singapore	5,334	8,006
France	970	10,602
U.S.A.	19,748	1,36,049
	26,052	1,54,657
Molluscs		
Itlay	660	7,852
	660	7,852
Prawns		
U. K.	14,691	76,246
Germany West.	255	2,693
Netherlands	2,571	11,696
France	11,205	55,490
Kuwait	13,110	36,242
Ceylon	1,78,191	3,86,821
Singapore.	1,84,096	5,87,995
Malaya	32,556	50,770
Hongkong	2,45,840	7,50,089
Saudi Arabia	3,552	11,729
Burma	26,72,574	69,66,619
Zanzibar	400	1,378
Mauritius	1,29,238	1,44,014
Canada	4,600	32,896
U. S. A.	11,43,496	54,52,920
Br. Guiana	563	2,470
Fr. W. Indies	761	5,680
Australia	29,952	2,06,721
Fiji Is.	205	1,410
Sweden	1,422	6,351
Italy	508	3,974
Kenya	152	1,541
Cuba	1,372	8,835
	46,71,310	1,48,04,280
TOTAL 031.03	46,98,022	1,49,65,789
TOTAL 031	1,55,62,716	3,80,99,435

Articles and Countries to which exported	*Quantity (Kgs.)*	*Value (Rs.)*
032 Fish and fish preparations canned or not.		
032·01 Fish, fish product and fish preparations in air-tight containers including Crustacea and Molluscs.		
Crustacea and Molluscs Prepn. canned.		
U. K.	14,078	73,742
Sweden	154	1,175
Denmark	3,186	25,784
Netherlands	256	2,736
Switzerland	120	1,510
Italy	1,072	12,208
Aden	713	6,892
Kuwait	509	5,770
Trcl Oman	205	2,881
Kenya	461	4,778
Mozambiqeue	819	10,680
Canada	5,812	42,723
U.S.A.	14,289	1,05,296
Belgium	51	329
	41,725	2,96,504
Fish canned Excl. Sardines and Pilchards.		
U. K.	4,125	38,561
Sweden	13,299	94,448
Denmark	4,665	46,033
Germany West	1,020	11,994
Netherlands	1,534	14,192
Switzerland	1,382	11,222
Italy	2,928	28,560
Cyprus	510	6,630
Aden	552	5,943
Bahrein Is.	1,135	9,584
Kenya	477	4,356
Canada	15,444	84,532
U.S.A.	2,21,646	10,42,466
Puerto Rico	461	4,839
Fr. W. Indies	357	3,445
Greece	661	8,150
Trcl Oman	152	2,269
Lebanon	661	2,638
Singapore	1,016	9,501
Fiji Is.	152	1,762
	2,71,870	14,26,322
Sadnes and Pilchards canned		
Netherlands	666	5,886
Cyprus	272	3,370
Behrein Is.	410	3,272
Canada	102	1,170
	1,450	13,698

Articles and Countries to which exported	*Quantity (Kgs.)*	*Value (Rs.)*
Other sorts		
Sweden	870	7,779
Italy	1,870	21,600
Cyprus	256	3,250
Trcl Oman	205	2,795
Kenya	815	8,358
Aden	153	2,047
Syria	152	1,424
Nepal	152	270
	4,473	47,523
Total 032·01	3,19,518	17,84,047
032·02 Fish, fish product and fish preparations not in airtight containers including Crustacea and Molluscs.		
Fish Prodct. Prepn. Nes. not canned.		
U. K.	4,674	19,448
Bahrein Is.	307	1,384
Singapore	52,500	15,120
Malaya	1,94,095	85,171
Saudi Arab	205	1,105
Aden	51	327
Ceylon	508	296
Kenya	152	656
Tanganyika	203	636
Total 032·02	2,52,695	1,24,143
Total 032	5,72,213	19,08,190
411 Animal oils and fats		
411·01 Oils from fish and marine animals		
Shark Liver Oil comml. quality.		
Ceylon	102	333
	102	333
Others		
Bahrein Is.	7,466	3,003
Kuwait	21,711	9,200
Trcl Oman	98,604	43,284
Iraq	50,035	25,601
Saudi Arab	17,853	10,068
Maldives	3,200	3,075
Muscat	966	330
Tanganyika	3,200	1,800
Kenya	813	525
	2,03,848	96,886
Total 411	2,03,950	97,219

Articles and Countries from which exported	*Quantity in (Kgs.)*	*Value in (Rs.)*
672·03. Natural and cultured Pearls unworked		
Pearls Natural		
Italy	..	4,445
Ceylon	..	4,541
		8,986
Pearls Cultured		
Germany W.	..	2,170
Ceylon	..	1,722
		3,892
672·04. Natural and cultured pearls worked but not set . .		
Pearls real worked		
Kuwait	..	1,24,634
Ceylon	..	4,685
Iraq	..	34,494
		1,63,813
Pearls cultured worked		
Switzerland	..	1,586
Singapore	..	7,076
U.S.A.	..	51,548
		60,210
Total 672 (03+04)		2,36,901

Import—1960 (January to December)

Articles and countries from which imported.

031. Fish fresh or simply preserved		
031·01 Fish fresh chilled or frozen		
Hilsa live or dead		
Pakistan E.	3028580	93,36,575
Fish fresh live or dead		
Others		
U.K.	2200·4	3,675
Pakistan E.	11181257·4	1,18,70,008
Pakistan W.	93184	1,12,038
Ceylon	..	40
Hongkong	51	2,218
	11277692·8	2,19,87,979
Bangdas wet salted		
Pakistan E.	8098	23,798

Articles and Countries from which imported	*Quantity (Kgs.)*	*Value (Rs.)*
Soormai wet salted		
Pakistan W.	1737·2	4,871
Saudi Arab	155956	1,65,555
	157693·2	1,70,426
Other fish wet salted		
U. K.	25907	23,093
Pakistan W.	1742166·4	14,42,974
Pakistan E.	585775	10,29,612
Hongkong	8636	3,400
	2362484·4	24,99,079
Total 031·01	16834548·4	3,20,17,857
031·02. Fish salted dried or smoked but not further prepared		
Bomlas dry unsalted		
Pakistan E.	104628·2	1,10,256
Fish dried unsalted		
Other sorts		
Pakistan W.	150423	62,868
Pakistan E.	116663.6	1,19,816
Hongkong	457·2	1,327
Muscat	345671·4	1,35,752
Maldives	768·0	1,726
Saudi Arab	92362	35,660
Japan	..	930
	706381·2	3,57,379
Fish cured		
U. K.	26009·6	1,162
Fish dried salted		
Pakistan W.	4454	1,794
Pakistan E.	22989	26,275
Hongkong	50·8	99
	27493·8	28,168
Fish smoked		
Germany W.	152·4	286
U. K.	205	3,422
Denmark	411	3,135
	768·4	6,843
Other sorts		
Pakistan E.	1587	3,600
U. K.	101·6	56
Hongkong	..	1,119
Japan	..	82
	1688·6	4,857

Articls and Countries from which imported	*Quantity* (*Kgs.*)	*Value* (*Rs.*)
Shark fins, Fishmaws similar fish parts—		
Hongkong	50·8	555
Total 031·02	867020·6	5,09,220
Total 031	17701569·0	3,25,27,077
Fish and fish preparations canned or not—		
032·1. Fish, fish products and fish preparations in airtight containers including Crustacea and Molluscs.		
Crustacea & Molluscs preparation canned—		
U. K.	..	774
Japan	50·8	480
	50·8	1,254
Fish canned excluding Sardines & Pilchards—		
U. K.	12037·4	35,426
Sweden	50·8	509
Norway	..	20
Denmark	101·6	973
Germany W.	152·4	1,596
Portugal	50·8	458
Switzerland	..	25
Singapore	..	164
Hongkong	711·2	3,192
Japan	254	840
	13358·2	43,203
Sardines & Pilchards canned—		
U. K.	126	1,506
Norway	5691·6	16,370
Germany	..	39
France	50·8	471
Portugal	984	2,579
	6852·4	20,965
Other sorts		
U. K.	101·6	1,676
U.S.S.R.	203·2	600
Sweden	50·8	287
Singapore	..	203
Switzerland	1512	8,467
	1867·6	11,233
TOTAL 032·01	22139·0	76,655

Articles and Countries from which imported	*Quantity (Kgs.)*	*Value (Rs.)*
032·02. Fish, fish products and fish preparations not in airtight containers including Crustacea & Molluscs.		
Fish product preparations not canned—		
U. K.	461	1,410
Denmark	210	2,195
Sweden	50·8	112
Total 032·02	721·8	3,717
Total 032	22860·8	80,372
081·04. Meat meal including tankage and Fishmeal		
Fish meal—		
Sweden	..	500
	..	500
411. Animal oils and fats—		
411·01. Oils from fish and marine animals,		
Cod Liver oil in other containers		
U. K.	64284·8	85,207
Norway	56673·2	76,718
	120958·0	1,61,925
Sperm oil—		
U. K.	66337·2	95,567
Norway	9506·6	12,879
Cyprus	4626	7,050
	80469·8	1,15,496
Whale oil crude—		
U. K.	3674	5,290
Others—		
Iraq	..	12
Sweden	2509	3,383
	2509	3,395
Total 411·01	207610·8	2,86,106

672. Precious and semiprecious Stones and Pearls unworked and worked.

672·03. Natural and cultured Pearls unworked

	Value in Rs.
Pearls Natural—	
U. K.	11,348
Bahrein Is.	5,08,418
Kuwait	1,01,039
Trc. Oman	1,61,400
Hongkong	25,544
Japan	39,38,846
U.S.A.	78,273
Italy	19,999
Pakistan W.	8,200
Brazil	3,776
	48,56,843

Pearling Divers Canoes in operation off Tuticorin

Hand lining operations from a Catamaran

	Value in Rs.
Pearls cultured—	
Hongkong	26,525
Japan	21,03,983
Bahrein Is.	7,166
	21,37,674
Total 672.03	69,94,517
672.04. Natural and cultured Pearls worked but not set.	
Pearls Buttons	
Japan (78 Grs)	713
Pearls real worked—	
Kuwait	49,200
Japan	12,994
	62,194
Pearls cultured worked—	
Japan	38,227
Total 672.04	1,01,134
Total 672(03+04)	70,95,651

Socio-Economics

Pilot experiment in changing the mode of credit in a marine fishing village

Capital from a Bank was made available to 4 group leaders of marine fishermen releasing them from the village money lenders. This enabled them to sell their own produce in the open market and in actual practice they sold it to the money lender at market rates. The arrangement was found to work smoothly and the earnings of the fishermen was nearly 50 per cent more in an average season. At the end of the season they are free from debt. The scheme indicates the feasibility of making cooperative capital available without security but with adequate supervision. It also emphasises on the need of making capital available to fishermen at current bank rates.

(G. N. Mitra, Director of Fisheries, Government of Orissa).

FISHERIES DEVELOPMENT IN THE STATES

Fisheries Activities in Madras State

The Pearl fishery off Tuticorin was inaugurated by Shri Bisnuram Medhi, Governor of Madras on 22nd March 1961. About 130 canoes and 1280 divers participated in the fishery and 2·75 lakhs of Oysters were fished on the

inaugural day. A total number of 154 lakhs of Oysters were fished from Tholayiram Par, Karaikeluthi Par and Koothadiyar Par during the season.

21 Fish curing yards were maintained by the Department to enable fishermen to resort to curing at Government yards under hygienic conditions. About 476 tons of fish were cured in these yards during January, 1961. At Cuddalore the construction of the fishing harbour progressed well. A sum of Rs. 54,240 and Rs. 26,000 was sanctioned for the construction of a building for the Ice Plant at Cuddalore and for the Compressor Unit at Ennore respectively. The Ice Plants at Mettur Dam and Tuticorin continued to function satisfactorily and supplied the required ice for fish preservation and transport. The two recently constructed insulated fish transport vans continued to transport fish from Pulicat to Madras city.

The Departmental Boat Building Yard at Madras supplied 66 Pablo type mechanised boats which are now being operated by the Fishermen Cooperative Societies, District Cooperative Federations and groups of fishermen. At present 40 fishermen are undergoing training at the two training centres at Tuticorin and Nagapattinam.

Under the intensive Seed collection scheme, about 2·69 lakhs of fingerlings have been collected and stocked in various inland waters upto the quarter ending March, 1961. Six reservoirs in the State have been taken for fisheries development and the stocking in these reservoirs continued. Induced breeding of carps by the pituitary injection method was experimented at Bhavanisagar Research Station. Mirror carp was induced to spawn with cat fish pituitary at Ooty.

Assistance to Fishermen Cooperative Societies for marketing of fish was given by way of loan and subsidy amounting to a sum of Rs. 7·39 lakhs upto the quarter ending March, 1961 for construction of godown. 3287 members of 63 Fishermen Cooperative Societies of the State have been benefited. A sum of Rs. 3387 was also sanctioned to the Colachal Municipality for the improvement of their fish market.

(Director of Fisheries, Government of Madras, Madras).

Fisheries Development in Himachal Pradesh

A good deal of progress has been made on the development of inland fisheries during the Second Five Year Plan. In 1955-56 the production was 5000 mds. per annum whereas during the Second Five Year Plan, the production increased to 6000 mds. per annum.

For the protection of fisheries, the Indian Fisheries Act IV of 1897 and the Punjab Fisheries Act II of 1914 with rules notified thereunder are in force in Himachal Pradesh. Fishing in the State is allowed only on permits issued by the Department. 6000 fishing licences were issued realising Rs. 40,000 as licence fee during the Second Five Year Plan.

In all 19 fish sanctuaries were notified in Himachal Pradesh under the Indian Fisheries Act IV of 1897 where fishing is strictly prohibited. The department continued survey of spawning grounds of fish and 41 grounds in the rivers in the various districts were located. Mirror Carp was first introduced

in 1955 when 210 Mirror carp fingerlings were imported from Kumaon Hills of U.P. During the Second Plan 1,48,000 Mirror carp fingerlings were raised and an area of 125 acres of impounded waters was brought under Mirror Carp culture. One Unit of Mirror Carp Hatchery with a capacity to produce 1.5 million fingerlings per annum was established to carry out stocking in an area of 36,000 acres of impounded waters of Himachal Pradesh including Gobind Sagar. 30,000 mds. of fish valued at Rs. 12 lakhs per annum would be raised from Gobind Sagar when fully developed.

Two Trout Hatcheries with a capacity to produce 1·50 lakhs trout ova per annum were established from where 4,04,000 trout ova were raised for stocking the trout waters of Himachal Pradesh during Second Five Year Plan.

Of over 11 lakhs population of H.P. more than 1300 people carry out fishing in order to supplement their otherwise meagre earning. The daily average catch of fishermen in Himachal Pradesh comes to $2\frac{1}{2}$ seers per day valued at 2.50 nP. which is considered to be a good average for the hilly regions.

[Secretary, (Forests) Himachal Pradesh Administration 19-5-1961]

Inland Fisheries in Orissa

During the Second Five Year Plan period, the State Government sponsored four schemes *viz.* Village Reclamation Service, Development of Fish Seed Centres, Establishment of Demonstration Fish Farm and Applied Research on Fresh water biology for the development of Inland Fisheries at a total cost of Rs. 34.99 lakhs. The activities have been mainly on supply of fish seed to the fish farmers, and giving training and demonstration to pisciculturists. Applied research work has also been taken up to achieve greater seed production per acre.

[Development (Fisheries) Department, Government of Orissa. 10-3-1961].

MARINE FISHERIES RESEARCH

Fishery Biology

Biology and fishery of 'Choo Parai' Selaroides leptolepis (Cuv. and Val).

Carangids form a commercially important group of fishes in India and *Selaroides leptolepis* (Cuv. and Val) is one of the common horse-mackeral of the Gulf of Mannar and the Palk Bay in the vicinity of Mandapam.

During the course of two years of investigation 830 fish of various sizes were examined from Pudumadam, Rameswaram Road and Rameswaram. The stomachs of the fish examined from Thangachimadam were invariably empty.

Points and Occurrence methods were followed to analyse the food contents. *Acartia, Oithona, Euterpina,* decapod and molluscan larvae are preferred in the lower groups whereas Lucifer, Acetes, Mysids and fishes in the higher ones. Fish show indications of cessation of feeding during night. It is mainly a carnivorous fish, occasionally feeding on phytoplankton.

(Tandon, K. K., Indian Jour. of Fisheries, Vol. VII, No. 1, April, 1960)

Study of Bombay Prawns

The present paper deals with the study of commercially important species of prawns found in the inshore areas of Bombay waters. The present studies brought to light some species unrecorded from this area such as *Penaeus canaliculatus, M. affinis, P. maxillipede, S. indicus, H. ensirostris* and also proved that a few of the species previously regarded as common are either very rare or totally absent.

The seasonal fluctuations as well as variation in abundance of various commercially important species have been studied and a brief account of the results of investigation of species mainly contributing to the prawn fishery of Bombay for their size, state of maturity and sex ratio have been given. *P. carinatus, P. indicus, M. monoceros, P. sculptilis,* females of *M. brevicornis* and *S. indicus* were found to be in the immature state, whereas males of *M. brevicornis* were found to reach maturity in this area. It would seem that *M. affinis, P. stylifera* and *P. maxillipede* prefer areas of soft mud, rich plankton and shallow coastal waters, where they mate and spawn.

Unlike other parts of India, prawn fishing is carried out throughout the year, but the different species have their own seasons of abundance and scarcities.

(Shaikhmahmud, F.S., and Tembe, V. B.,—Indian Jour. of Fisheries Vol. VII, No. I, April, 1960)

Hydrobiology

Observations on the Distribution and Occurrence of Diatoms in the Inshore waters of the Gulf of Mannar and Palk Bay

From year to year qualitative and quantitative variations, as well as fluctuations of a minor nature in the regularity in appearance or disappearance of diatoms and their blooms are found in every region. As the diatoms constitute the chief components of the primary food supply of the sea, data on their occurrence, distribution pattern and fluctuations are of importance. The paper presents the results of a study of the nature and composition of the diatom community that occur in the plankton of Mandapam area, the abundance of species and the recurrent pattern in the annual distribution of the various species.

Fortynine out of the fiftyone species of diatoms occurring commonly in the planktons of Mandapam area have been classified into bio-geographical groups and the general character of the diatom flora of the Gulf of Mannar and Palk Bay is described.

The seasonal variations and periodicities exhibited by the fifteen species, which are well-represented in the plankton have been compared for both the places. It is found that the biological spring falls in May and the 'autumnal maximum' occurs in October or November. Most of these species are formed with a spring maxima but which remain more or less important throughout the season while a few are with a distinct spring and autumn maxima.

The data suggest that Palk Bay is having a larger breeding stock of autochthonous diatoms which are mostly neritic whereas in the Gulf of Mannar there are more Oceanic diatoms.

The validity of the existing biogeographical grouping of some of the species of diatoms and the necessity of widening the concept of species habits and habitats are mentioned in the light of the available data.

(Raghu Prasad, R., and Ramchandran Nair, P. V. Indian Journal of Fisheries. Vol. VII, No. I, April 1960)

INLAND FISHERIES RESEARCH

Preliminary Observations on the Spawning of Indian Carps, induced by Injections of Pituitary Hormones

Inducing successful spawning of the major Indian carps in confined waters by administering pituitary hormones is an important landmark in the history of fish culture in the East and opens up an entirely new field for selective breeding of cultivable fishes and progressive fish farming.

Experiments carried out during July-August 1957 at Cuttack, to induce the Indian carps to breed under the influence of fish pituitary extracts administered intraperitoneally are described.

Successful spawning, including normal fertilization and hatching of eggs was achieved by this method in *Labeo rohita, Labeo calbasu* and *Labeo bata*. The spawning environment was fresh pond-water in one instance, and tap water in the rest. No flow of water was provided to induce spawning. Pituitary glands of *Labeo rohita* (sexes mixed) preserved in absolute alcohol, induced spawning in all the three species mentioned above. The successful dose varied from 1.5 to 4.0 pituitary glands for *Labeo rohita;* 0.33 to 1.0 gland for *Labeo bata* and 0.5 glands for *Labeo calbasu.* Ordinarily not more than two injections were required to induce spawning. In several cases a single injection induced spawning, within a period of 7-12 hours. Particulars of eggs laid, percentage of fertilization and hatching in respect of *Labeo calbasu* and *Labeo bata* are given. The eggs of all the three species were successfully hatched and the hatchlings grown in ponds.

(Alikunhi, K. H. Vijayalakhmanan, M. A. and Ibrahim, K. H., Indian Journal of Fisheries, Vol. VII, No. I, April 1960)

Fish Breeding Experiments at Cuttack

Arrangements for conducting large scale fish breeding experiments in order to standardise the methods in induced fish breeding of Carps were made at the Central Inland Fisheries Research Institute's Sub-Station at Cuttack. Over 1000 pituitary glands from fishes were collected from Calcutta and Gwalior for fish breeding experiments during the quarter. With the commencement of monsoon the fish breeding experiments have already been initiated at Cuttack Sub-Station.

Large scale breeding of *Cyprinus carpio* was carried out during the quarter April to June and large quantities of seed of this fish was distributed to several agencies including all the Extension Units in different parts of India.

(Central Inland Fisheries Research Institute, Barrackpore).

Survey of Brackishwater Culture Fisheries Resources in West Bengal.

As there was no precise knowledge of the extent of this resource and also the existing practices of brackishwater fish culture, it was considered essential to undertake a detailed survey of both the resources and the present practices of fish culture. This will be useful in undertaking the right type of research on brackishwater culture fisheries in the proposed Brackishwater Fish Farm at Kakdwip.

(Central Inland Fisheries Research Institute, Barrackpore).

Hydrobiology.

Some observations on pollution of the Suvaon stream by the effluents of a sugar factory, Balrampur (U.P.)

The pollutional effects of the waste from a sugar factory at Balrampur (U.P.) on the fish and fishery of the river Suvaon, a small tributory of the Rapti, has been studied in detail. Chemical and physical analysis of the effluent and the bio-assay experiments, conducted with fish from the fresh water zone, show that the wastes do not contain any substances directly toxic to fish life, the pollution being purely of organic nature. The primary effect of the wastes is to deplete environment of its dissolved oxygen and following the process of decomposition of organic matter, anærobic condition in the environment is developed which in association with other favourable elements like low red-ox potential, presence of sufficient organic matter and constant supply of sulphate from the waste, stimulate activation of sulphur-reducing bacteria producing hydrogen sulphide, a gas highly toxic to fish. At the very low dissolved oxygen level, hydrogen sulphide becomes lethal at a sub-lethal concentration and a large-scale fish mortality results in the 2-mile stretch of the river below the outfall. The fish mortality being of annual occurrence the assessed loss to the fishery of the Suvaon is quite considerable. Study of chemical quality of the water and distribution of fish, plankton and bottom animals in the 11-mile stretch of the Suvaon show that very unfavourable ecological conditions exist

for about two miles below the outfall. As the factory operates on a seasonal basis only and that there is no scarcity of land in the locality, cheap effective remedial measures for improvement of the environment have been suggested.

(Santimoy Banerjea and Motwani, M.P., Indian Journal of Fisheries, Vol. VII, No. 1, April 1960).

FISHERIES TECHNOLOGICAL RESEARCH.

Transport of the common crab (Scylla serrata) in living condition

Storage and transport of live edible crustaceans, especially crabs and lobsters for marketing them at places distant from the fishing grounds, has been quite a recent development in the fishing industry. To find out a suitable method for their live transport, keeping the packing cost as low as possible, investigations were first undertaken on crabs, *Scylla serrata,* the most common commercial species of crabs all along the coast of India.

Scylla Serrata lived outside sea-water for the periods ranging from 24—210 hours, depending upon the percentage of humidity in the atmosphere. These crabs, when packed in a closed tin containing marine algæ, did not survive for more than 24 hours. Algæ itself being a perishable commodity, cotton soaked in sea water was used for packing and it was found that the crabs survived for 17-18 days. For commercial packings, cotton being a costly material, crabs were packed in wood-shaving soaked in sea-water and it was found that crabs lived for seven days. A trial consignment of 18 crabs packed in wet wood-shavings was despatched from Bombay to Delhi and all the crabs were found alive when the parcel was opened 52 hours after it was despatched.

(Vasudeo, R.B. and Kewalramani, H.G., Indian Journal of Fisheries, Vol. VII, No. I, April, 1960).

FOREIGN

GENERAL AND DEVELOPMENT

U.S. 1960 Catch

United States Tuna production in 1960 reached a record 15·2 million cases compared with 14·3 million the previous year. The total of course includes Puerto Rican and American Samoan output. Two-thirds of the total tuna pack was canned in California.

The U.S. total fisheries catch in 1960 was 4850 million lb., according to preliminary figures. This was 270 million lbs. less than in 1959. But ex-vessel value of the 1960 catch (347 million dollars) was a million dollars more than in 1959.

Sea scallops, with total landings of 26.5 million lbs. of meat, and menhaden oil production of 23·7 million gallons, were also production records. But the menhaden catch of almost 2000 million lb. (about 41 p.c. of the total fishery catch) was 209 million lbs. below 1959.

In 1960 there were record imports of Shrimp (113.4 million lbs.), fresh and frozen lobster (32.3 million lbs.), fresh and frozen sea scallops (6·9 million lbs.)

The oyster take of 59 million lbs. of meat was the lowest for over 100 years.

By the weight of landings (million lbs.), San Pedro was the leading fishing port with 360, followed by Lewes (Del) 281, Pascagoula (Miss) 213, Gloucester (Mass.) 194.

(Fisheries Newsletters—June 1961 p. 15).

Fish Meal Meeting sponsored by F.A.O.

Delegations from 21 nations plus observers from five international non-governmental organisations, will meet in March, at the headquarters of the Food and Agriculture Organisation (FAO).

The rising production of fish meal, which has gone up by some 700,000 tons in five years, has lowered the price of fish meal from about $ 130 a ton to $ 75 a ton.

The government delegations, which in many cases will be made up of government representatives, technical experts and representatives from the fish-meal industry, will be welcomed to the nine-day meeting by Dr. Norman C. Wright, Dy. Director General of Food & Agriculture Organisation.

In addition to the 21 government delegations, observers from the General Agreement on Tariffs and Trade (GATT), United Nations Children's Fund (UNICEF), United Nations High Commissioner for Refugees (UNHCR), the European Association for Animal Production and the International Association of Fish Meal Manufacturers will be attending the meeting.

F.A.O. Release—(1414/61-FAO dated 21-3-61).

Technology.

Measures for preventing damages to Driftnets

Fleets of drift nets rigged with warp below the nets are used in fishing for herring in the North Atlantic. However, when fishing in greater depths (about 60 m. and more) which is seldom the case, the warps are rigged above the nets. One of the main purposes of the warps is to carry the load when the fleet of nets is stretched and pulled due to the drift of the vessel. Although the drifting speed, even in gales, seldom exceeds I m./sec. (2 knots), breaks of warp occur due to sudden jerks caused by squalls and waves. The following equation is suggested for computing the Tension in warp in drift net fishing:

Articls and Countries from which imported	*Quantity (Kgs.)*	*Value (Rs.)*
Shark fins, Fishmaws similar fish parts—		
Hongkong	50·8	555
Total 031·02	867020·6	5,09,220
Total 031	17701569·0	3,25,27,077
Fish and fish preparations canned or not—		
032·1. Fish, fish products and fish preparations in airtight containers including Crustacea and Molluscs.		
Crustacea & Molluscs preparation canned—		
U. K.	..	774
Japan	50·8	480
	50·8	1,254
Fish canned excluding Sardines & Pilchards—		
U. K.	12037·4	35,426
Sweden	50·8	509
Norway	..	20
Denmark	101·6	973
Germany W.	152·4	1,596
Portugal	50·8	458
Switzerland	..	25
Singapore	..	164
Hongkong	711·2	3,192
Japan	254	840
	13358·2	43,203
Sardines & Pilchards canned—		
U. K.	126	1,506
Norway	5691·6	16,370
Germany	..	39
France	50·8	471
Portugal	984	2,579
	6852·4	20,965
Other sorts		
U. K.	101·6	1,676
U.S.S.R.	203·2	600
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Cod Liver oil in other containers		
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672. Precious and semiprecious Stones and Pearls unworked and worked.		
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Brazil		3,776
		48,56,843

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Hand lining operations from a Catamaran

MARINE FISHERIES RESEARCH

I. C. N. A. F. Research

The International Commission for the North-West Atlantic Fisheries has announced the research programme assigned to Canada for 1961. The Fisherises Research Board of Canada, the agency which performs this country's ICNAF scientific duties, has a heavy workload ahead in commission sub-areas 2, 3, 4, and 5.

Staff of the Board's biological station at St. Andrews, N.B., and St. John's, Nfld., along with its Oceanographic Group at Halifax will this year cations. study the life-history of fishes, conduct among other things, compile statistics on catch lohydrographic studies and take part in fishing gear comparison tests. Eight research vessels will be used in the programme including the "A. T. Cameron", the largest and most modern of the Board's fleet.

A collection of statistics of catch locations and catch per unit of effort from the offshore ground fish fleet will be compiled. Scientist will also sample statistics of landings and fishing effort for a few inshore groundfish areas. Information will be gathered on the numbers and sizes of cold, haddock, halibut and scallops discarded at sea.

Those fish which will have their life-histories come under the gaze of scientists include cod, haddock, halibut, pollock, redfish and American plaice. Increased emphasis will be placed on the study of inshore cod. Tagging operations will also be performed.

The annual bottom population survey of haddock by ottertrawl will be carried out on the Grand Bank and on St. Pierre Bank in May and June. Other bottom surveys for cod and American plaice are scheduled.

Deep water explorations for redfish cod will be continued. Comparative fishing operations of research vessels will take place in April.

Hydrography projects in the offing include a survey of the south-western Gulf of St. Lawrence, a survey of the Labrador of coast and basin, and a survey south and east of Newfoundland.

(Trade News—March 1961, p. 26).

Hydrology of South East Australian waters: Bass Strait and New South Wales Tuna fishing area

This paper examines the hydrological data collected in South-East Australian water over a number of years, and presents the annual cycle of the surface circulation.

Part A includes the discussion on seasonal changes in the current systems on Bass Strait shown from recoveries of drift bottles released at four points in the region, brief reference to the winter-summer rhythm in prevailing meteorological conditions on the southern sea board, and a summary of chlorinity and water temperature data collected in the area during 1938—59. From this evidence it is concluded that there is a seasonal rhythm in the circulation of the surface waters in Bass Strait.

In Part B the surface circulation off the southern coast of New South Wales is shown to undergo an annual cycle. During summer, movement of the East Australian current shorewards brings high-chlorinity water to the continental shelf. During March, South Equational components bring lower chlorinity water, but in April and May these disappear and the shelf is flooded with high-chlorinity water from the Trade Drift. In winter the East Australian current moves offshores and low-chlorinity subsurface water is found on the continental shelf. Upwelling occurs on the shelf throughout the year, but it is more pronounced in winter. In late winter, water produced by mixing in eastern Bass Strait appears off-Eden and makes its way northwards along the Coast.

(B. S. Newell Tech. Paper No. 10. CSIRO, Australia 1961).

INLAND FISHERIES RESEARCH

Tilapia Culture in Kenya

Experiments in Kenya showed a better growth rate in shallow (1 foot) and in clear water, as opposed to deep (2 feet) and turbid. At the two extremes, shallow clear and deep turbid, the former showed 26% greater length and 43% greater weight of fish, the responsible features being almost certainly water temperature which is maintained at a higher level for longer each day in clear and shallow water. This again results in a faster growth rate directly and a better diatom growth. Breeding and nesting enhance turbidity. Hence monosex culture promotes growth. Shallow ponds are more economical to establish and to operate. Danger is the greater liability to predation.

(West Indies Fisheries Bulletin—Jan.-Feb. 1961).

GENERAL FISHERY NEWS

Central Institute of Fisheries Education

The Central Institute of Fisheries Education, sponsored by the Union Government in cooperation with the State Government started functioning in Bombay on 1st July, 1961 at the Institute of Science, Bombay pending the erection of a new building to house the new Central Institute. The first batch of trainees will comprise officers deputed by the different State Governments. Each State will be entitled to send two to four candidates per year. In course of time this Institute will take in trainees from other eastern countries and will serve the needs of the Asian region.

The Institute offers a two year course in all aspects of fisheries both inland and marine. It will also provide specialised training in inland fisheries, fish handling and processing technology, fishing gear technology, fisheries economics and business management and fish marketing and trade.

The Government of India has planned to secure the services of foreign experts for some time for certain specialised course of training.

Film on Pond Culture

The educational film on scientific methods of culturing fish in ponds prepared by the Ministry of Information and Broadcasting in cooperation with the Ministry of Food & Agriculture has been awarded the President's Gold Medal for 1960. Copies of the film in English and Hindi have now been supplied to all the Fisheries Extension Units. During the next financial year, it is proposed to prepare versions of this film in the regional languages also. This film will be used by the Fisheries Extension Units in connection with the audio-visual demonstrations which form an important item of extension work in all the States.

Aid to Orissa for Fish Breeding

Shri M. V. Krishnappa, Deputy Minister of Agriculture informed the Lok Sabha on 1st March, 1961 that central financial assistance by way of grants and loans was given to the Orissa State for fishery schemes. In addition, the Central Inland Fisheries Research Sub-station at Cuttack provided training to the technical staff of the State Fisheries Department in the technique of induced breeding of carps by administering pituitary harmones. During the last four years 175 lakhs of spawn and 39 lakhs of fry and fingerlings of carps produced by the new technique have been supplied to the State Fisheries Department for stocking.

With central financial assistance 36 fish seed centres have been established and over 61 lakhs of fingerlings have been produced in these centres. 13 village reclamation service Units have been established, to help in the reclamation of water areas for fish culture. Two demonstration fish farms for fresh water and brackish water fish culture have been established. Successful experiments in power fishing were conducted in the Hirakud Reservoir and the estuarine and coastal waters. Applied researches are being carried out by the State Government with central assistance on problems relating to fresh water biology and technology. A tentative allocation of Rs. 150 lakhs has been made in the State Sector for fisheries scheme of the Orissa State during the Third Plan.

Mechanised Fishing Boats

The target tentatively set for mechanised fishing boats is about 4000 under the Third Five Year Plan. The installed capacity for fishing boat production is about 1,000 per year. No proposal in the form of engines exclusively designated as marine engines has yet been licensed. However, some of the engine already being manufactured or proposed to be manufactured are adoptable for marine applications with slight modifications. Some schemes for the manufacture of engines exclusively designed for marine applications have been received and these are under Government's consideration. Regular production of engines suitable for marine application is likely to be established by the end of this year. No separate capacity is allocated for marine engines as these will be a part of the overall capacity of the firms concerned for production of their engines.

About 1 to 2% of India's fishing boats are mechanised; the present trend has been to develop new designs for boats, rather than fit up engines in the indigenous boats. The cost of a mechanised boat varies according to its size and the horsepower of the engine. It ranges from Rs. 8,000 per boat of 22 ft.

in length to Rs. 50,000 per boat of 36 ft. in length. The estimated increased landings of fish by mechanised boats are about 70,000 tons per annum.

This information was given by Shri M. V. Krishnappa, Deputy Minister of Agriculture, in the Lok Sabha on 12th April, 1961.

Training in Deep Water Fishing

Mr. S. B. Gulbadamov, F.A.O. Expert in Deep Water Fishing conducted a training course at Maithon from 15th to 31st October, 1960. Seven Assistant Fisheries Extension Officers along with 8 State Fisheries Development Officers from various States attended the course to acquaint themselves with the techniques developed by Mr. Gulbadamov for improving gillnets used for fishing in reservoirs and similar water areas. Lectures and demonstrations were arranged in the basic principles of making improved types of nets for operation in inland waters. The Extension Units are now engaged in trying the use of such improved nets in different areas. Some of the Units are also organising the training of State department personnel, as well as fishermen, in making such improved nets.

Seminar on Fish Culture

A seminar for Fisheries Extension Officers and nominees of State Governments was held at the Cuttack Sub-Station for a period of 9 days from 17th to 25th April, 1961. Detailed discussions, including field demonstrations were held on the following aspects of fish culture:—

(1) Induced breeding of Indian carps by injection of pituitary hormones;

(2) Breeding and cultivation of common carp;

(3) Weed control methods in fishery waters;

(4) Soil and water qualities in fish ponds and fish production in them;

(5) Culture of fish in paddy fields; mono-sex culture of Tilapia and preliminary observations on Chinese Grass Carp.

At the conclusion of the Seminar consignments of common carp spawn, fry and fingerlings were supplied to the various officers to enable them to raise stocks in their respective areas.

Fisheries Syllabus Committee

The Fisheries Extension Units of the Government of India as well as some of the State Fisheries Departments are at present organising training of C.D. and N.E.S. Block personnel in fisheries development work. With a view to standardising the training, the Ministry of Community Development has constituted a Committee to draw up uniform syllabi. The first meeting of the Committee was held at Cuttack on the 5th January, 1961 and draft syllabi

for the training of Block Development Officers and Gram Sahayaks, Social Education Officers and Mukhya Sevikas, were prepared.

Re-orientation of the Fisheries Extension Programmes

After detailed discussions with the Officers in charge of the Fisheries Organisations in different States and ascertaining their requirements of extension work in different areas, the programme of work of the Central Fisheries Extension Units have been re-orientated. Considerable emphasis has been laid on the programme of training field personnel of the State Fisheries Departments, Extension Officers (Fisheries) of the C.D. and N.E.S. Blocks as well as other Community Development personnel. A programme of demonstrating improved methods of fish culture in privately owned ponds has been initiated with a view to demonstrating to the public the possibilities of obtaining increased yields from fish ponds by the application of new methods of fish culture. Besides providing the required technical assistance and subject matter support to the State Fisheries Organisations, the Units are also conducting film show, Community talks etc. and the preparation and distribution of extension materials such as pamphlets, slides, film strips etc.

Refresher Courses for Fisheries Officers of Community Development Areas

Under a scheme sponsored by the Extension Directorate of the Ministry of Food & Agriculture two regional refresher courses were organised in Barrackpore (W. Bengal) and Mysore with a view to (a) bringing the Fisheries Officers working in C.D. and N.E.S. Blocks up-to-date in regard to their knowledge on researches and developments in their field (b) giving them an opportunity to discuss the problems faced during their work in the field (c) exchanging ideas and pooling their experience for mutual benefits and (d) imparting practical training in the technique of programme planning and evaluation.

The first refresher course was inaugurated on 22-9-60 at the Central Inland Fisheries Research Institute, Barrackpore by Shri H. Bannerjee, Development Commissioner, Government of West Bengal. It was organised by the Fisheries Extension Unit of Calcutta and Gauhati in collaboration with the Central Inland Fisheries Research Institute, Barrackpore. Twelve Fisheries Officers deputed by the Government of Orissa, Assam, Madhya Pradesh, Tripura and Manipur attended this five weeks course. Specialists on various subjects from the Central Fisheries Research Institute, State Fisheries Departments of West Bengal and Orissa, the Ministry of Food & Agriculture and the Ministry of Community Development, gave lectures and demonstrations. A number of field trips and study tours were also organised.

The Second Regional Refresher Course was organised at Mysore from 8th October to 6th November, 1960 by the Fisheries Extension Units of Bangalore and Hyderabad in collaboration with the Mysore State Fisheries Department. It was inaugurated by Shri N. Rachiah, Minister for Agriculture, Social Welfare and Excise of the Government of Mysore. Twenty-three officers deputed by the States of Gujarat, Maharashtra, Mysore, Andhra Pradesh, Madras, Kerala and Pondicherry attended the course. Lectures and demonstrations, were conducted by specialists of the Central Fisheries Organisation, Fisheries Department, Mysore and the Community Development Ministry.

Inland Fisheries Training Course

The Inland Fisheries Training Course was reorganised in accordance with the recommendations of the Fisheries Education Committee. It is proposed to train larger number of candidates from this year. The training commenced from 1st June 1961 and so far 42 candidates—17 deputed and 14 stipendiaries nominated by the various State Governments, 2 foreign candidates and 9 private candidates have joined the course. Another 8 candidates are expected to join.

This training course has been helpful in providing trained personnel to the State Fisheries Departments.

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